

An annotated catalogue of the types of bush-crickets and crickets (Orthoptera, Ensifera) housed in the Zoological Museum Hamburg (ZMH)

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Abstract

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Types represent the ultimate taxonomic information of a species and hence represent the most important specimens in museums. The entomological collections of the Zoological Museum Hamburg (now part of the Centrum für Naturkunde) hold several thousand primary types of insects. However, despite their importance currently no type database exists and catalogues have not been updated since almost 50 years and are only available in German. Following the publication of our catalogue of Caelifera types, we here present an updated catalogue for the Ensifera types held in the collection in English language. 74 species are represented as types with 105 specimens; of these 44 are name-bearing types: 36 holotypes, 3 lectotypes, 4 syntypes and 1 neotype. The remaining specimens are para- (55), paralecto- (4), allo- (1) and neoallotypes (1). Most of the species were described by Max Beier (18), Tevfik Karabak (13), Josef Redtenbacher (13) and the former curator of the collection Herbert Weidner (10). In his catalogues in 1966 and 1977 Weidner recorded types of 73 species present in the collection and an additional 65 as potentially lost in the war; 71 of the types recorded by Weidner were still present, whereas two could not be found (*Xiphidium geniculare* Redtenbacher, 1891; *Xiphidium longipes* Redtenbacher, 1891); one species recorded as lost by Weidner was found (*Lezina acuminata* Ander, 1938) and one species (neoallotype of *Paradecolya inexpectata* Chopard, 1957) and one additional type individual (paratype of *Choeroparnops forcipatus* Beier, 1949) are newly reported for the collection.

Introduction

Natural history collections are the main archives of biodiversity. They focus on collecting, maintaining and documenting natural specimens, a crucial task in times of biodiversity decline. The Zoological Museum of Hamburg (ZMH), now part of the Center of Natural History Hamburg (CeNak), holds large collections across all animal groups. With approximately four million specimens and several thousand primary types, the entomological collection is among the most important ones in Germany.

Despite their importance, the entomological collections in Hamburg are not well documented, nor digitized. Herbert Weidner, a former curator of the collection had published an important series of papers from the 60s until the late 70s, where he documented the collections in much detail (first catalogue - Weidner (1962), last catalogue - Weidner (1979)). However, since the work of Weidner more than 40 years have passed without further documentation. Further, Weidner's catalogues were all published in German and hence difficult to access for international researchers. Therefore, we have started revising the type

catalogues (Satori et al. 2016; Dey and Husemann 2018; Harms and Duperre 2018), to give an update on the type material housed in the ZMH in English language.

The Orthoptera can be grouped into the suborders of grasshoppers (Caelifera) and the crickets and bush-crickets (Ensifera). The Ensifera with more than 15 000 contemporary species are the larger of the two groups (Cigliano et al. 2018). They contain the superfamilies Tettigonioidea, Grylloidea, Gryllotalpoidea and Rhaphidophoroidea and have their diversity hotspots in the tropical regions. Thanks to the large collections of the private museum Godeffroy, the ZMH had large numbers of tropical specimens of Ensifera, including many types. While most of the Hemimetabola material was saved during WW2 in the Rochsburg in Saxony, unfortunately many of the types of Ensifera were lost as they were housed in the exhibition room during the bombing (Weidner 1966). Especially types from Josef Redtenbacher und Brunner van Watten-

wyl were destroyed (Weidner 1966, 1977). Nevertheless, Weidner listed 72 species as present as types in the collection (Weidner 1977).

Here, we provide an updated catalogue for the Ensifera types currently housed in the ZMH. In contrast to Weidner’s catalogue, we provide two separate lists: one for the type material which is currently present (Table 1) and a second one for material which should be here, but could not be found and likely got destroyed during the war (Table 2, reproduced from Weidner 1966, 1977). The entomological collection of the ZMH currently houses 105 type specimens of Ensifera belonging to 74 species; these include 44 name-bearing types: 36 holotypes, 3 lectotypes, 4 syntypes, and 1 neotype; the other 61 types are not name-bearing: 55 paratypes, 4 paralectotypes, 1 neoallotype, and 1 allotype. Thereof 72 species were already recorded by Weidner (1966, 1977), including one as missing reported individual. The types of two species

Table 1. The table shows all type specimens housed in the collection of the ZMH including the original genus and species name, the type status indicated by the abbreviations H for holotype, P for paratype, S for syntype, A for allotype, L for lectotype, PL for paralectotype, N for neotype, and NA for neoallotype. The number and sex of type specimens are shown. Moreover, the table shows information about author and year of description of the material. The collector, date of collection and collection location are provided. We also present the current nomenclature as in Cigliano et al. (2018). Additionally, the old type catalogues of Weidner (1966, 1977) were compared with the present list (Y = yes, the species was present in Weidner (1966, 1977), M = missing and N = no, the material was not recorded in the old type catalogue. The *Lit.* column shows the reference number of the original description (* Ref.); in case of a lecto-, or paralectotype the author and year of type designation are presented (# Ref.). The references of the numbers are included below. Question marks indicate missing information of a specimen. All location data is directly transcribed from labels and not interpreted.

No.	Genus	Species	Current taxonomy	Type	Count, sex	Author, year	Collector, year	Location	Weidner	Lit.
Anostostomatidae										
1	<i>Lezina</i>	<i>acuminata</i>	–	H	1♂	Ander, 1938	?	South-Abbessia, Darassum	M	*1
Gryllacrididae										
2	<i>Eonius</i>	<i>michaelseni</i>	<i>Pareremus michaelseni</i>	S	1♂ 1♀	Griffini, 1913	Hamburger S.W. Australische Expedition 1905	Tamala	Y	*11
3	<i>Epacra</i>	<i>corii</i>	–	H	1♀	Karny, 1935	Museum Godeffroy, No. 15838	Australia, Peak Downs	Y	*18
4	<i>Epacra</i>	<i>cyaneoterminata</i>	<i>Amphibogryllacris cyaneoterminata</i>	H	1♀	Karny, 1935	Museum Godeffroy, No. 4590	Australia, Rockhamptons	Y	*18
5	<i>Eremus</i>	<i>hartmeyeri</i>	SYN of <i>Pareremus guttifrons</i>	H	1♂	Griffini, 1913	01.06.1905	Buckland Hill, Stat. 114 near Fremantle	Y	*11
	<i>Eremus</i>	<i>hartmeyeri</i>	SYN of <i>Pareremus guttifrons</i>	P	1♀ Larvae	Griffini, 1913	01.06.1905	Buckland Hill, Stat. 114 near Fremantle	Y	*11
6	<i>Gryllacris</i>	<i>grylloides</i>	<i>Niphetogryllacris grylloides</i>	H	1♂	Karny, 1935	F. Sikora, July 1901	Madagascar, Anevoka	Y	*18
7	<i>Gryllacris</i>	<i>liberiana</i>	<i>Atychogryllacris liberiana</i>	H	1♂	Karny, 1935	H. A. Hedler	Liberia	Y	*18
8	<i>Gryllacris</i>	<i>mioccana</i>	<i>Phryganogryllacris mioccana</i>	H	1♂	Karny, 1935	Le Guill, Museum Godeffroy, No. 10138	Mioko	Y	*18
9	<i>Gryllacris</i>	<i>modestipennis</i>	–	H	1♀	Karny, 1935	Museum Godeffroy, No. 17384	Ponape	Y	*18
10	<i>Gryllacris</i>	<i>titschaki</i>	<i>Brachybaenus titschacki</i>	H	1♂	Karny, 1935	?	Colombia , West South America	Y	*18
11	<i>Hyperbaenus</i>	<i>bohlsii</i>	–	H	1♂	Giglio-Toss, 1895	J. Bohls	Paraguay	Y	*10

No.	Genus	Species	Current taxonomy	Type	Count, sex	Author, year	Collector, year	Location	Weidner	Lit.
Tettigoniidae										
12	<i>Acanthoproctus</i>	<i>elaphos</i>	SYN of <i>Acanthoproctus cervinus</i>	H	1♂	Weidner, 1941	H. Rolle, 14.06.1905	Africa, Windhuk	Y	*23
	<i>Acanthoproctus</i>	<i>elaphos</i>	SYN of <i>Acanthoproctus cervinus</i>	P	1♀	Weidner, 1941	K. Wegeleben	Africa, Rehoboth	Y	*23
13	<i>Aethiomerus</i>	<i>adelphus</i>	–	H	1♂	Redtenbacher, 1891	A. O. Swald ded., 01.04.1890	Madagaskar, 20 miles north from Tamatave	Y	*20
14	<i>Ancistrocercus</i>	<i>costaricensis</i>	<i>Ancistrocercus</i> (<i>Ancistrocercus</i>) <i>costaricensis</i>	H	1♂	Beier, 1954	R. Paessler, 14.–21.07.1911	Costa Rica, Punta Arenas	Y	*3
15	<i>Bradyopisthius</i>	<i>dentatus</i>	–	H	1♀	Weidner, 1941	C. v. Erlanger, 12.–18.05.1901	Africa, Djeroko	Y	*23
16	<i>Bradyopisthius</i>	<i>klatti</i>	–	H	1♂	Weidner, 1941	C. v. Erlanger, 12.04.1901	Africa, South Abessinien, near mouth of Manelin in Ganale Doria River	Y	*23
	<i>Bradyopisthius</i>	<i>klatti</i>	–	P	1♀	Weidner, 1941	C. v. Erlanger, 04.-05.01.1901	Africa, South Abessinien, Dagaja near Mane	Y	*23
17	<i>Caulopsis</i>	<i>gracilis</i>	–	P	1♀	Redtenbacher, 1891	?	Rosario	Y	*20
18	<i>Choeroparnops</i>	<i>forcipatus</i>	–	H	1♂	Beier, 1949	H. Rolle, 26.10.1903	Bolivia, Yungas de la Paz, 1000m	Y	*2
	<i>Choeroparnops</i>	<i>forcipatus</i>	–	P	1♀	Beier, 1949	H. Rolle, 26.10.1903	Bolivia, Yungas de la Paz, 1000m	Y	*2
	<i>Choeroparnops</i>	<i>forcipatus</i>	–	P	1♀	Beier, 1949	O. Staudinger, 05.02.1902	Peru, Marcapata	N	*2
19	<i>Clonia</i>	<i>angolana</i>	<i>Clonia</i> (<i>Clonia</i>) <i>angolana</i>	H	1♂	Kaltenbach, 1971	01.08–15.07.1959	Angola, Province Mocamedes, Capolopopo	Y	*12
20	<i>Clonia</i>	<i>assimilis</i>	<i>Clonia</i> (<i>Hemiclonia</i>) <i>assimilis</i>	P	1♂	Kaltenbach, 1971	?	Republic South-Africa, Port Natal	Y	*12
21	<i>Clonia</i>	<i>saussurei</i>	<i>Clonia</i> (<i>Clonia</i>) <i>saussurei</i>	H	1♂	Kaltenbach, 1971	H. Brauns, 15.12.1898	Oranje-Freistaat, Bothaville	Y	*12
22	<i>Cocconotus</i>	<i>paessleri</i>	<i>Cocconotus</i> (<i>Cocconotus</i>) <i>paessleri</i>	H	1♀	Beier, 1960	R. Paessler, 26.12.1901	Guatemala, Champerico	Y	*4
23	<i>Conocephalus</i>	<i>breviceps</i>	SYN of <i>Euconocephalus incertus</i>	S	1♂	Redtenbacher, 1891	?	unknown location	Y	*20
24	<i>Corycus</i>	<i>greeffi</i>	<i>Corycoides greeffi</i>	L	1♀	Krauss, 1890	R. Greeff	Guinea-Island, St-Thome, Rolas	Y	#3 *19
	<i>Corycus</i>	<i>greeffi</i>	<i>Corycoides greeffi</i>	PL	1♂	Krauss, 1890	R. Greeff	Guinea-Island, St-Thome	Y	#3 *19
25	<i>Cratonotus</i>	<i>brevixiphus</i>	<i>Schedocentrus brevixiphus</i>	H	1♂	Beier, 1960	H. Rolle, 26.10.1903	Bolivia, Yungas de la Paz, 1000m	Y	*4
26	<i>Cratonotus</i>	<i>nigrescens</i>	<i>Schedocentrus nigrescens</i>	P	1♀	Beier, 1960	O. Staudinger, Collection Brunner von Wattenwyl	Peru	Y	*4
27	<i>Dicranacrus</i>	<i>furcifer</i>	–	P	3♂ 3♀	Redtenbacher, 1891	T. Frey	Madagaskar, Nossi-Bé	Y	*20
28	<i>Diyllus</i>	<i>maximus</i>	–	H	1♂	Beier, 1960	09.09.1926	Costa Rica, Farm Hamburg at Reventazon	Y	*4
	<i>Diyllus</i>	<i>maximus</i>	–	P	1♀	Beier, 1960	F. Nevermann, 09.11.1930	Costa Rica, Parismina river, 3km next to mouth	Y	*4
29	<i>Drepanoxiphus</i>	<i>quadripunctatus</i>	–	H	1♂	Beier, 1960	W. Fritsche, 05.10.1913	Colombia, Pandi, Cundinamarca	Y	*4
30	<i>Enthacanthodes</i>	<i>ecuadoricus</i>	–	H	1♀	Beier, 1954	E. Feyer & F. Ohaus, 20.06.1911	Ecuador, Riobamba-Macas	Y	*3
31	<i>Enthacanthodes</i>	<i>spinosus</i>	–	P	1♀	Beier, 1954	J. Michaelis, 22.04.1898	Brasil, Espirito Santo	Y	*3
32	<i>Enyaliopsis</i>	<i>inflatus</i>	–	H	1♂	Weidner, 1941	P. O. Mufindi, 06.07.1932	Africa, Tanganyika, Kiananga	Y	*23
	<i>Enyaliopsis</i>	<i>inflatus</i>	–	P	1♀	Weidner, 1941	Stierlein, 09.06.1898	Africa, Uhehe	Y	*23
33	<i>Enyaliopsis</i>	<i>robustus</i>	–	P	1♂	Weidner, 1957	M. Fontaine, Aug. 1953	Coll. Mus. Congo, Sankuru, Katak-Kombe	Y	*24
	<i>Enyaliopsis</i>	<i>robustus</i>	–	P	1♀	Weidner, 1957	Schwetz	Coll. Mus. Congo, Lomami	Y	*24

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34	<i>Eugaster</i>	<i>spinulosa</i> var. <i>immaculata</i>	SYN of <i>Eugaster spinulosa</i>	H	1♀	Weidner, 1941	A. Bartels, 21.08.1906	Morocco, Mazagan	Y	*23
35	<i>Eurycorypha</i>	<i>arabica reducta</i>	–	H	1♂	Uvarov, 1936	H. v. Wissmann, 09.-10.1931	Arabia, Hadhramaut, Wadi Humum near Mukalla	Y	*22
36	<i>Gampsocleis</i>	<i>acutipennis</i>	–	P	1♀	Karabag, 1956	T. Karabag, 29.07.1954	Turkey, Elazig, Palu, Dabanli	Y	*14
37	<i>Gnathoclitia</i>	<i>laevifrons</i>	–	H	1♂	Beier, 1960	W. Siegmund, 01.12.1898	South-America	Y	*4
38	<i>Gymnoproctus</i>	<i>rammei</i>	–	P	1♀	Weidner, 1941	E. Obst, 16.-17.06.1911	Wakinga-Land between Hohelohe- and Nyarasa-ditch	Y	*23
39	<i>Idiarthron</i>	<i>hamuliferum</i>	–	H	1♂	Beier, 1960	F. Nevermann, 12.04.1922	Costa Rica, plan de Limon, near Las Mercedes, 150–300m, 20–30 km from Atlantic	Y	*4
	<i>Idiarthron</i>	<i>hamuliferum</i>	–	A	1♀	Beier, 1960	F. Nevermann, 22.05.1922	Costa Rica, plan de Limon, near Las Mercedes, 150–300m, 20–30 from Atlantic	Y	*4
	<i>Idiarthron</i>	<i>hamuliferum</i>	–	P	1♂	Beier, 1960	F. Nevermann, 12.04.1922	Costa Rica, plan de Limon, near Las Mercedes, 150–300m, 20–30 km from Atlantic	Y	*4
	<i>Idiarthron</i>	<i>hamuliferum</i>	–	P	1♀	Beier, 1960	F. Nevermann, 18.02.1922	Costa Rica, plan de Limon, near Las Mercedes, 150–300m, 20–30 km from Atlantic	Y	*4
	<i>Idiarthron</i>	<i>hamuliferum</i>	–	P	1♀	Beier, 1960	F. Nevermann, 01.11.1921–30.11.1921	Costa Rica, plan de Limon, near Las Mercedes, 150–300m, 20–30 km from Atlantic, Farm Hamburg Reventazón 10–30m	Y	*4
	<i>Idiarthron</i>	<i>hamuliferum</i>	–	P	1♂	Beier, 1960	F. Nevermann, 10.08.1928	Costa Rica, S. José	Y	*4
	<i>Idiarthron</i>	<i>hamuliferum</i>	–	P	1♀	Beier, 1960	F. Nevermann, 19.12.1930	Costa Rica, Salvadora Farm, Eingang Nr. 34 1931	Y	*4
40	<i>Isophya</i>	<i>autumnalis</i>	–	P	1♂ 1♀	Karabag, 1962	T. Karabag, 04.09.1956	Turkey, Trabzon, Zigana Daghi, 2500m	Y	*16
41	<i>Isophya</i>	<i>bicarinata</i>	–	P	1♂ 1♀	Karabag, 1957	T. Karabag, 02.08.1954	Turkey, Bingöl daglari, Zarovan yaylasi, 2800m	Y	*15
42	<i>Isophya</i>	<i>thracica</i>	–	P	1♂ 1♀	Karabag, 1962	May 1952	Turkey, Thrace, Sinekli	Y	*16
43	<i>Kopis</i>	<i>brasiliensis</i>	–	P	1♀	Beier, 1960	J. Michaelis, 22.04.1898	Brasilia, Espirito Santo	Y	*4
44	<i>Leurophyllum</i>	<i>granulatum</i>	–	H	1♂	Beier, 1954	R. Haensch, 30.04.1903	Ecuador	Y	*3
45	<i>Lobaspis</i>	<i>quadrituberculata</i>	<i>Nicsara quadrituberculata</i>	H	1♂	Redtenbacher, 1891	Museum Godeffroy No. 15041	Australia, Rockhamptons	Y	*20
46	<i>Locusta</i>	<i>maculata</i>	SYN of <i>Gampsocleis glabra</i>	L	1♂	Charpentier, 1825	Museum Lüneburg, Coll. Heyer	?	Y	#3 *7
	<i>Locusta</i>	<i>maculata</i>	SYN of <i>Gampsocleis glabra</i>	PL	1♀	Charpentier, 1825	Museum Lüneburg, Coll. Heyer	?	Y	#2 *7
47	<i>Madiga</i>	<i>stettinensis</i>	<i>Spalacomimus stettinensis</i>	N	1♂	Weidner, 1941	H. Rolle, Naturkunde Museum Stettin	Africa, Uganda, Entebbe	Y	*23
	<i>Madiga</i>	<i>stettinensis</i>	<i>Spalacomimus stettinensis</i>	P	1♀	Weidner, 1941	H. Rolle, Naturkunde Museum Stettin	Africa, Uganda, Entebbe	Y	*23
48	<i>Mastighaphoides</i>	<i>haffneri</i>	–	H	1♀	Weidner, 1965	A. Wagner, 02.10.1905	Australia, New-South-Wales, Tweed-River	Y	*25

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49	<i>Mimetica</i>	<i>semialata</i>	–	H	1♀	Beier, 1960	O. Bürger, 01.01.1898	Columbia, Villavicentio	Y	*4
50	<i>Odontolakis</i>	<i>tibialis</i>	–	P	1♀	Redtenbacher, 1891	A. O. Swald , 02.07.1888	Madagaskar, Nossi-Bé	Y	*20
51	<i>Onomarchus</i>	<i>philippinensis</i>	–	H	1♀	Weidner, 1965	W. Jark, 1931	Philippines	Y	*25
52	<i>Oxyprora</i>	<i>surinamensis</i>	–	P	1♀	Redtenbacher, 1891	?	Surinam	Y	*20
53	<i>Paradecolya</i>	<i>inexpectata</i>	–	NA	1♂	Chopard, 1957	F. Sikora, 19.02.1902	Le Réunion 1901, Plaine des Palmistes	N	#1 *9
54	<i>Parapholidoptera</i>	<i>spinulosa</i>	–	P	1♀	Karabag, 1956	Ö. K. Güler, 15.07.1952	Turkey, Adana, Kozan	Y	*14
55	<i>Parapholidoptera</i>	<i>ziganensis</i>	–	P	1♂ 2♀	Karabag, 1964	T. Karabag, 04.09.1956	Turkey, Trabzon, Zigana Dagi, 2500m	Y	*17
56	<i>Pemba</i>	<i>brunnea</i>	–	P	1♀	Beier, 1960	H. Rolle, 26.10.1903	Bolivia, Yungas de la Paz, 1000m	Y	*4
57	<i>Peringueyella</i>	<i>jocosa multispina</i>	–	P	1♀	Kaltenbach, 1971	H. Brauns, 09.10.1899	Orange-Freistaat, Bothaville	Y	*12
58	<i>Platycleis</i>	<i>grisea occidentalis</i>	SYN of <i>Platycleis albopunctata albopunctata</i>	P	1♀	Zeuner, 1931	Michaelsen, 28.08.1990	Switzerland, Spiez	Y	*26
	<i>Platycleis</i>	<i>grisea occidentalis</i>	SYN of <i>Platycleis albopunctata albopunctata</i>	P	1♀	Zeuner, 1931	Michaelsen, 20.08.1990	Switzerland, Beckenried	Y	*26
59	<i>Poecilimon</i>	<i>cervoides</i>	–	P	1♂ 1♀	Karabag, 1964	T. Karabag, 27.06.1961	Turkey, Mozgat, Sorgum, Baglarbasi köyü, Belpinar	Y	*17
60	<i>Poecilimon</i>	<i>cervus</i>	–	P	1♀	Karabag, 1950	T. Karabag, 28.06.1949	Turkey, Ankara, Nallihan	Y	*13
61	<i>Poecilimon</i>	<i>glandifer</i>	–	P	1♂	Karabag, 1950	T. Karabag, 06.06.1947	Turkey, Ankara, Orman Ciftligi	Y	*13
62	<i>Poecilimon</i>	<i>harveyi</i>	–	P	1♂	Karabag, 1964	K.M. Guichard & D. H. Harvey, 23.07.1960	Turkey, Erzurum, Kop dagi gecidi, 6–7000 ft.	Y	*17
63	<i>Poecilimon</i>	<i>serratus</i>	–	P	1♂	Karabag, 1962	T. Karabag, 04.06.1946	Turkey, Bursa, Karacabey Harasi	Y	*16
64	<i>Poecilimon</i>	<i>turcicus</i>	–	P	1♂	Karabag, 1950	T. Karabag, 01.06.1946	Turkey, Anatolia, Bursa, Karacabey, Harasi	Y	*13
65	<i>Poecilimon</i>	<i>xenocercus</i>	–	P	1♀	Karabag, 1956	T. Karabag, 26.06.1954	Corum, Iskilip	Y	*14
66	<i>Pseudorhynchus</i>	<i>acuminatus acuminatus</i>	–	S	1♀	Redtenbacher, 1891	E. Versman, 25.09.1886	East coast of Sumatra, Langkat	Y	*20
67	<i>Pseudorhynchus</i>	<i>flavolineatus</i>	–	L	1♀	Redtenbacher, 1891	?	Siam	Y	#3 *20
68	<i>Salomona</i>	<i>sigma</i>	SYN of <i>Salomona godeffroyi</i>	P	1♂	Redtenbacher, 1891	Museum Godeffroy	Mioko, Duke of York Island	Y	*20
69	<i>Salomona</i>	<i>suturalis</i>	–	H	1♀	Redtenbacher, 1891	Museum Godeffroy, No. 15037	Samoa	Y	*20
70	<i>Salomona</i>	<i>truncata</i>	–	P	1♀	Redtenbacher, 1891	Museum Godeffroy, No. 10095	Pelew-Islands	Y	*20
71	<i>Scorpiorinus</i>	<i>impressopunctatus</i>	–	H	1♀	Beier, 1960	F. Nevermann, 01.12.1926	Costa-Rica, Plan de Limon near Las Mercedes, Farm Hamburg am Reventazon, 12–30km to Atlantic ocean	Y	*4
72	<i>Teleutias</i>	<i>surinamus</i>	–	P	1♀	Beier, 1960	C. Heller, 04.08.1908	Dutch Guiana, District Cottica	Y	*4
73	<i>Xiphidium (Xiphidium)</i>	<i>affine</i>	<i>Conocephalus affinis</i>	PL	1♀	Redtenbacher, 1891	Museum Godeffroy, No. 2729	Samoa, Ovalaua	Y	#2 *20
	<i>Xiphidium (Xiphidium)</i>	<i>affine</i>	<i>Conocephalus affinis</i>	PL	1♂	Redtenbacher, 1891	Museum Godeffroy, No. 2729	Samoa, Ovalaua	Y	#2 *20
74	<i>Xiphophyllum</i>	<i>limbatum</i>	<i>Xiphophyllum (Proteroxiphus) limbatum</i>	H	1♂	Beier, 1960	O. Staudinger, 05.02.1902	Peru, Marcapata	Y	*4

Table 2. The table shows all type specimens that should be in the collection based on the literature and card system, but are currently missing in the collection of the ZMH; given are the original genus and species name, the type status including the abbreviations H for holotype, P for paratype, and S for syntype. The number and sex of missing type specimens are presented. Moreover, the table shows information about author and year of description of the material. Furthermore, the collector, date of collection and collection location are provided. We also present the current nomenclature as in Cigliano et al. (2018). Additionally, the old type catalogues of Weidner (1966, 1977) were compared with the present list of missing data: Y = yes, the species was present in Weidner (1966, 1977), M = missing and A = absent (the material was not shown in the old type catalogue, but is in the card system). The *Lit.* column shows the reference number of the original description. The references of the numbers are included below. Question marks indicate missing information.

No.	Genus	Species	Current taxonomy	Type	Count, sex	Author, year	Collector, year	Location	Weidner	Lit.
Conocephalinae										
1	<i>Agroecia</i>	<i>maculata</i>	<i>Iaratrox maculata</i>	P	1?	Redtenbacher, 1891	?	Brasil, Theresopolis	M	*20
2	<i>Alphopteryx</i>	<i>decemmaculata</i>	SYN of <i>Veria colorata</i>	H	1♂	Redtenbacher, 1891	?	Australia, Peak Downs	M	*20
3	<i>Conocephalus</i>	<i>brachyxiphus</i>	<i>Euconocephalus brachyxiphus</i>	P	1?	Redtenbacher, 1891	?	Malacca, Perak	M	*20
4	<i>Conocephalus</i>	<i>brevis</i>	<i>Neoconocephalus brevis</i>	H	1♀	Redtenbacher, 1891	?	Uruguay, Montevideo	M	*20
5	<i>Conocephalus</i>	<i>brunneri</i>	<i>Neoconocephalus brunneri</i>	P	??	Redtenbacher, 1891	?	Argentina, Buenos Aires, Yalapa, Rosario	M	*20
6	<i>Conocephalus</i>	<i>cornutus</i>	<i>Pseudorhynchus cornutus</i>	P	??	Redtenbacher, 1891	?	Mioko	M	*20
7	<i>Conocephalus</i>	<i>fuscipes</i>	SYN of <i>Ruspolia lineosa</i>	P	??	Redtenbacher, 1891	?	Japan	M	*20
8	<i>Conocephalus</i>	<i>fuscomarginatus</i>	SYN of <i>Neoconocephalus vittipennis</i>	S	??	Redtenbacher, 1891	?	Brasil, Curitiba, Uruguay, Montevideo	M	*20
9	<i>Conocephalus</i>	<i>indicus</i>	<i>Euconocephalus indicus</i>	P	??	Redtenbacher, 1891	?	China	M	*20
10	<i>Conocephalus</i>	<i>insulanus</i>	SYN of <i>Neoconocephalus triops</i>	P	1♀	Redtenbacher, 1891	?	Singapore	M	*21
11	<i>Conocephalus</i>	<i>lemur</i>	SYN of <i>Ruspolia differens</i>	P	1♀	Redtenbacher, 1891	?	Madagascar	M	*20
12	<i>Conocephalus</i>	<i>macropterus</i>	SYN of <i>Neoconocephalus triops</i>	P	1♀	Redtenbacher, 1891	?	Argentina, Buenos-Aires	M	*20
13	<i>Conocephalus</i>	<i>maculosus</i>	<i>Neoconocephalus maculosus</i>	H	1♀	Redtenbacher, 1891	?	Brasil, Lages	M	*20
14	<i>Conocephalus</i>	<i>mimeticus</i>	<i>Pseudorhynchus mimeticus</i>	H	1♂	Redtenbacher, 1891	?	Australia, Sidney	M	*20
15	<i>Conocephalus</i>	<i>nigropunctatus</i>	SYN of <i>Neoconocephalus affinis</i>	P	??	Redtenbacher, 1891	?	Surinam	M	*20
16	<i>Conocephalus</i>	<i>picteti</i>	<i>Euconocephalus picteti</i>	P	1♂	Redtenbacher, 1891	?	Malacca, Perak	M	*20
17	<i>Conocephalus</i>	<i>prasinus</i>	<i>Neoconocephalus prasinus</i>	H	1♂	Redtenbacher, 1891	?	Mexico	M	*20
18	<i>Conocephalus</i>	<i>procerus</i>	<i>Neoconocephalus procerus</i>	S	♀	Redtenbacher, 1891	?	Argentina, Buenos-Aires	M	*20
19	<i>Conocephalus</i>	<i>pustulatus</i>	SYN of <i>Neoconocephalus exaltatus</i>	P	1?	Redtenbacher, 1891	?	Brasilia, Theresopolis	M	*20
20	<i>Conocephalus</i>	<i>surinamensis</i>	SYN of <i>Neoconocephalus punctipes</i>	P	1?	Redtenbacher, 1891	?	West India	M	*20
21	<i>Conocephalus</i>	<i>vaginalis</i>	<i>Euconocephalus vaginalis</i>	H	1♀	Redtenbacher, 1891	?	Australia, Peak Downs	M	*20
22	<i>Conocephalus</i>	<i>viridis</i>	<i>Neoconcephalus viridis</i>	P	??	Redtenbacher, 1891	?	Brasilia, Rio grande do Sul	M	*20
	<i>Conocephalus</i>	<i>viridis</i>	<i>Neoconcephalus viridis</i>	P	??	Redtenbacher, 1891	?	Uruguay, Montevideo	M	*20
23	<i>Glaphyronotus</i>	<i>roseipennis</i>	<i>Metholce nigratarsis</i>	H	1♀	Redtenbacher, 1891	?	Australia, Sidney	M	*20
24	<i>Lobaspis</i>	<i>bifasciata</i>	<i>Nicsara bifasciata</i>	P	1?	Redtenbacher, 1891	?	Australia, North-Queensland	M	*20

No.	Genus	Species	Current taxonomy	Type	Count, sex	Author, year	Collector, year	Location	Weidner	Lit.
25	<i>Pyrgocoypha</i>	<i>velutina</i>	-	P	1?	Redtenbacher, 1891	?	?	M	*20
26	<i>Salomona</i>	<i>antennata</i>	-	P	1♀	Redtenbacher, 1891	?	?	M	*20
27	<i>Xiphidium</i>	<i>bituberculatum</i>	<i>Orchelium bitubaculatum</i>	S	?♂ ?♀	Redtenbacher, 1891	?	Australia, Sidney, Rockhampton and New-South-Wales	M	*20
28	<i>Xiphidium</i>	<i>guineense</i>	<i>Conocephalus (Palotta) guineensis</i>	H	1♀	Redtenbacher, 1891	?	West-Africa, Gaboon	M	*20
29	<i>Xiphidium</i>	<i>infumatum</i>	<i>Conocephalus (Xiphidion) infumatus</i>	H	1♀	Redtenbacher, 1891	?	Mioko	M	*20
30	<i>Xiphidium</i>	<i>latifrons</i>	<i>Conocephalus (Xiphidion) latifrons</i>	P	1?	Redtenbacher, 1891	?	Australia, Sidney	M	*20
31	<i>Xiphidium</i>	<i>longicorne</i>	<i>Concephalus (Xiphidion) longicornis</i>	P	??	Redtenbacher, 1891	?	Yap, Baratonga, Carolinen	M	*20
32	<i>Xiphidium</i>	<i>longipes</i>	<i>Conocephalus (Opeastylus) longipes</i>	P	1?	Redtenbacher, 1891	?	Brasilia, Santa Catharina	Y	*20
33	<i>Xiphidium (Xiphidium)</i>	<i>geniculare</i>	SYN of <i>Anisoptera semivittatus vittatus</i>	P	1?	Redtenbacher, 1891	?	Mioko	Y	*20
34	<i>Xiphidium (Xiphidium)</i>	<i>modestum</i>	SYN of <i>Conocephalus (Chloroxiphidion) upoluensis</i>	P	??	Redtenbacher, 1891	?	Australia, Sidney, Peak Downs, Samo-Islands and Tongatabu	M	*20
Gryllinae										
35	<i>Cophogryllus</i>	<i>americanus</i>	-	S	?♂ ?♀	Chopard, 1954	28.04.1904	Peru, Cajamarca	M	*8
36	<i>Gryllodes</i>	<i>bohlsii</i>	<i>Miogryllus bohlsii</i>	H	1♂	Giglio-Tos, 1895	J. Bohls	Paraguay	M	*10
Phaneropterinae										
37	<i>Alectoria</i>	<i>superba</i>	-	H	1♀	Brunner v. Wattenwyl, 1879	?	Australia, Peak Downs	M	*5
38	<i>Caecidia</i>	<i>porrecta</i>	-	H	1♀	Brunner v. Wattenwyl, 1879	?	Australia, Rockhamptons	M	*5
39	<i>Polichne</i>	<i>angustiloba</i>	-	S	1♂ 1♀	Brunner v. Wattenwyl, 1879	?	Australia, Peak Downs and Rockhampton	A	*5
40	<i>Polichne</i>	<i>argentata</i>	-	S	1♂ 1♀	Brunner v. Wattenwyl, 1879	?	Australia, Peak Downs	M	*5
41	<i>Polichne</i>	<i>brevipes</i>	-	H	1♂	Brunner v. Wattenwyl, 1879	?	Australia, Peak Downs	A	*5
42	<i>Polichne</i>	<i>longipes</i>	-	H	1♀	Brunner v. Wattenwyl, 1879	?	Australia, Rockhampton	M	*5
43	<i>Protina</i>	<i>guttulata</i>	-	H	1♀	Brunner v. Wattenwyl, 1879	?	Australia, Peak Downs	M	*5
Podoscirtinae										
44	<i>Aphonomorphus</i>	<i>luteicornis</i>	-	H	1♂	Chopard, 1954	09.05.1936	South-Peru, Esperanza, 900m, near Licht	M	*8
Pseudophyllinae										
45	<i>Adenes</i>	<i>albifrons</i>	-	H	1♀	Brunner v. Wattenwyl, 1895	?	Guinea	M	*6
46	<i>Brunnea</i>	<i>cincticollis</i>	-	S	12♂♀	Brunner v. Wattenwyl, 1895	?	Perak, Malacca	M	*6
47	<i>Clepsydronotus</i>	<i>nevermanni</i>	-	H	1♂	Beier, 1954	06.06.1936	Costa Rica, Hondura	M	*3
48	<i>Cocconotus</i>	<i>ignobilis</i>	SYN of <i>Schedocentrus (Proidiarthron) innotatus</i>	P	1?	Brunner v. Wattenwyl, 1895	?	Venezuela	M	*6
49	<i>Dasyscelus</i>	<i>demigratus</i>	SYN of <i>Dasyscelus normalis</i>	H	1♀	Brunner v. Wattenwyl, 1895	?	Gabon	M	*6
50	<i>Diophanes</i>	<i>abbreviatus</i>	<i>Xiphophyllum abbreviatum</i>	H	1♂	Brunner v. Wattenwyl, 1895	?	Mexico, Veracruz, Jalapa	M	*6
51	<i>Incanotus</i>	<i>atricoxatus</i>	-	P	1♀	Beier, 1960	?	Peru, Sivia	M	*4
52	<i>Lichenochrus</i>	<i>decoloratus</i>	-	H	1♀	Brunner v. Wattenwyl, 1895	?	Gabon	M	*6
53	<i>Lichenochrus</i>	<i>infumatus</i>	-	S	??	Brunner v. Wattenwyl, 1895	?	Brasilia, Rio de Janeiro	M	*6
54	<i>Lichenochrus</i>	<i>tessellata</i>	<i>Acanthodis tessellata</i>	H	1♀	Brunner v. Watenwyl, 1895	?	Venezuela	M	*6

No.	Genus	Species	Current taxonomy	Type	Count, sex	Author, year	Collector, year	Location	Weidner	Lit.
55	<i>Lissophyllum</i>	<i>intermedium</i>	SYN of <i>Platyphyllum viridifolium</i>	P	1?	Brunner v. Wattenwyl, 1895	?	Brasilia, Rio de Janeiro	M	*6
56	<i>Mustius</i>	<i>inversus</i>	-	H	1♀	Brunner v. Wattenwyl, 1895	?	Cameroon	M	*6
57	<i>Onomarchus</i>	<i>nobilis</i>	SYN of <i>Onomarchus leuconotus</i>	H	1♀	Brunner v. Wattenwyl, 1895	?	Sumatra, Palenburg	M	*6
58	<i>Schedocentrus</i>	<i>angustixiphus</i>	-	H	1♀	Beier, 1960	?	Peru, Sivia, 520m	M	*4
59	<i>Schedocentrus</i>	<i>titschacki</i>	-	H	1♀	Beier, 1960	?	Peru, Sivia, 520m	M	*4
60	<i>Scorpiorus</i>	<i>nigrostriolatus</i>	<i>Caloxiphus nigrostriolatus</i>	P	1?	Brunner v. Wattenwyl, 1895	?	Mexico, Jalapa	M	*6
61	<i>Stenoschema</i>	<i>angustipenne</i>	-	H	1♂	Beier, 1954	15.05.1936	Peru, Sivia, 520m	M	*3
Rhaphidophoridae										
62	<i>Heteromallus</i>	<i>gracilipes</i>	-	H	1♂	Ander, 1938	Ch. E. Porter	Chile, Pucon at Villarrica lake	M	*1
63	<i>Heteromallus</i>	<i>piceus</i>	-	H	1♀	Ander, 1938	?	Chile, Pucon at Villarrica lake	M	*1
64	<i>Stonychophora</i>	<i>tessellata minor</i>	<i>Stonychophora minor</i>	H	1♂	Ander, 1938	Winkler	Borneo, Butik Raja, above 2200m	M	*1
Trigoniinae										
65	<i>Anaxipha</i>	<i>marginipennis</i>	-	H	1♀	Chopard, 1954	15.05.1936	South-Peru, jungle	M	*8
66	<i>Anaxipha</i>	<i>rufoguttata</i>	-	H	1♀	Chopard, 1954	12.05.1936	South-Peru, Sivia, jungle	M	*8
67	<i>Anaxipha</i>	<i>titschacki</i>	-	H	1♀	Chopard, 1954	15.05.1936	Soth-Peru, Sivia, jungle	M	*8

Literature: #1 Jin and Kevan 1992; #2 Pitkin 1980; #3 Weidner 1966; 1* Ander 1938; *2 Beier 1949; *3 Beier 1954; *4 Beier 1960; *5 Brunner v. Wattenwyl 1879; *6 Brunner v. Wattenwyl 1895; *7 Charpentier 1825; *8 Chopard 1954; *9 Chopard 1957; *10 Giglio-Tos 1895; *11 Griffini 1913; *12 Kaltenbach 1971; *13 Karabag 1950; *14 Karabag 1956; *15 Karabag 1957; *16 Karabag 1962; *17 Karabag 1964; *18 Karny 1935; *19 Krauss 1890; *20 Redtenbacher 1891; *21 Scudder 1893; *22 Uvarov 1936; *23 Weidner 1941; *24 Weidner 1957; *25 Weidner 1965; *26 Zeuner 1931

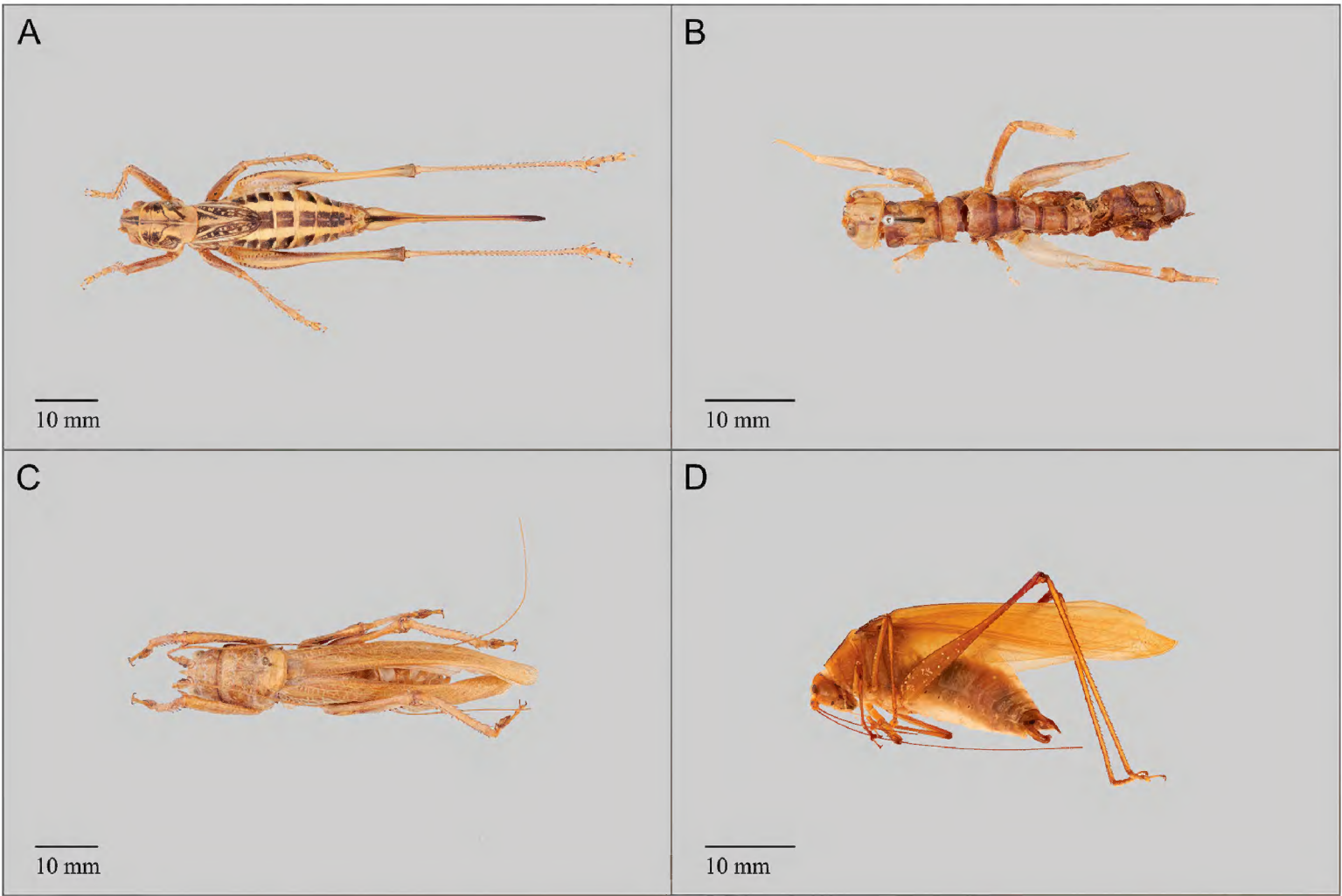


Figure 1. This figure shows **A:** dorsal view the paratype of *Gampsocleis acutipennis* Karabag, 1955; **B:** dorsal view of the holotype of *Lezina acuminata* Ander, 1938, which was declared as missing by Weidner (1966, 1977) and was recently sent back by NHM Lund; **C:** dorsal view of a paratype of *Salomona sigma* Redtenbacher, 1891; **D:** lateral view of the potential type specimen of *Para-caedicia appendiculata* Fritze, 1914; the status of the specimen is unclear; the label is shown in Figure 3.

are newly recorded for the ZMH. Pictures of all types are available via Cigliano et al. (2018), largely provided already by the DORSA project (Riede et al. 2018; see Figs 1 and 2 for examples of specimens and labels).

Two of the 72 species reported by Weidner could not be found during our data acquisition (*Xiphidium geniculare* Redtenbacher, 1891; *Xiphidium longipes* Redtenbacher, 1891). One type, which was recorded



Figure 2. Typical labels of several important taxonomists, who deposited material in the collection: **A:** Hermann Krauss, **B:** Tefvik Karabag, **C:** Heinrich Hugo Karny, **D:** Herbert Weidner, **E:** Max Beier, **F:** Alfred Kaltenbach, **G:** Josef Redtenbacher.

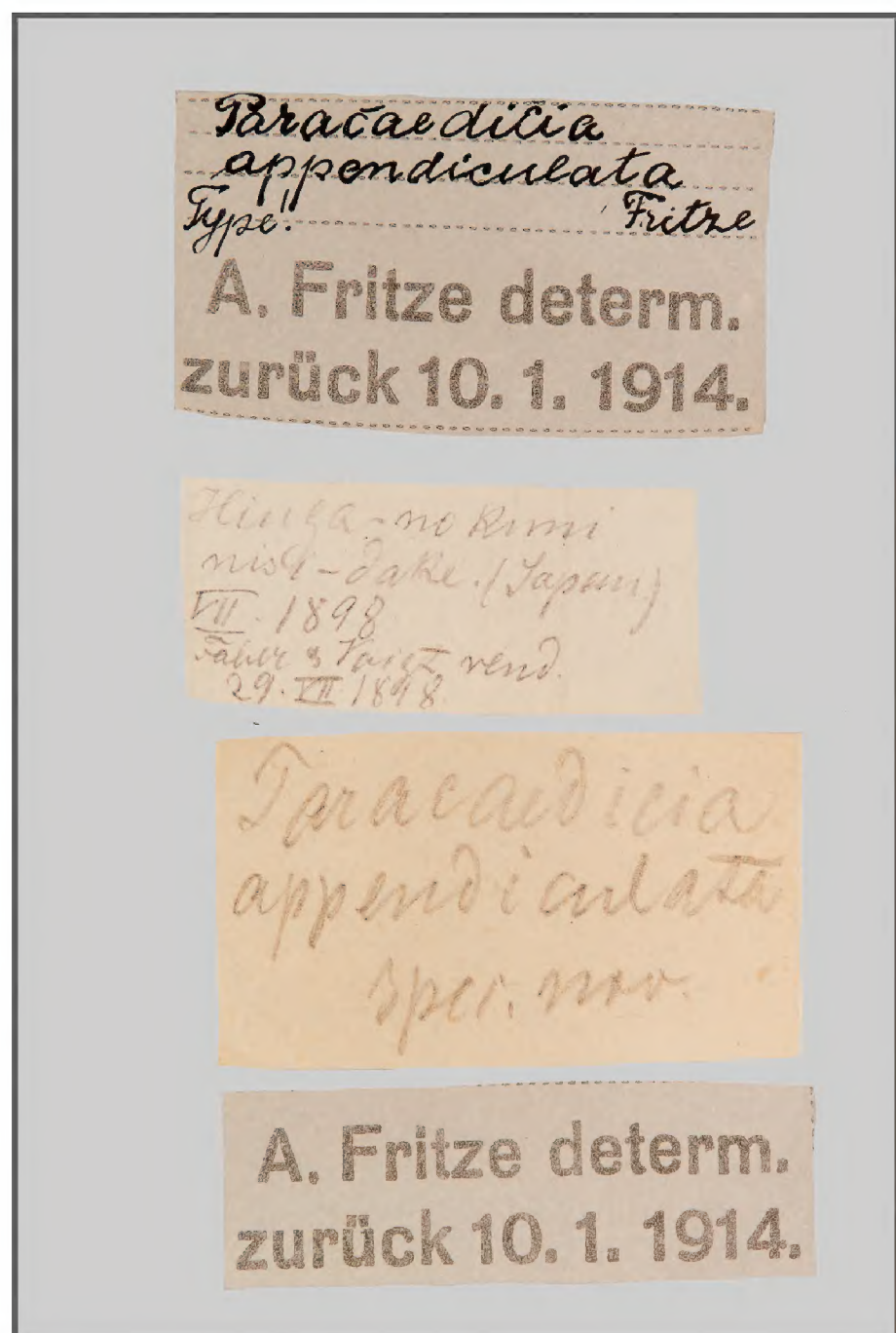


Figure 3. Label of the specimen of unknown status (Fig. 1D) described by Adolf Fritze.

as missing by Weidner was *Lezina acuminata* Ander, 1938; this type was recently send to us by the NHM Lund. The two newly reported species for the collection are: *Paradecolya inexpectata* Chopard, 1957 and an

individual of *Choeroparnops forcipatus* Beier, 1949. Moreover, 67 species should be present as types according to catalogues and according to Cigliano et al. (2018), but could not be found (Table 2); 63 of these were already mentioned as missing by Weidner (1966, 1977). It is unclear how many specimens are concerned and if these were destroyed or were on loan at this time.

In addition to the identified types the collection holds some old specimens which may be types, but require further investigation (e.g. Fig. 1, 3). Hence, the collection is not fully understood yet and future in depth investigations may identify further unlabeled type specimens.

Glossary

The definitions of types are according to the International Commission on Zoological Nomenclature (ICZN).

Name-bearing types – specimens with a name bearing function (i.e. holotype, syntype, lectotype, neotype)

Holotype – a single specimen on which a new taxon is based in the original publication

Allotype – a specimen of opposite sex of the holotype (no name-bearing function)

Syntype – specimens of a type series that collectively constitute the name-bearing type

Cotype – the term should be avoided; the specimen can be similar to a syntype or a paratype

Lectotype – a specimen that was a syntype, but was designated as unique bearer of a name

Neotype – a name bearing type designated for an existing taxon when no name-bearing type is extant

Paratype – specimens belonging to a type species not being the holotype

Paralectotype – the remaining specimens of a syntype series after the designation of a lectotype

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